PJAHS
Philippine Journal of Allied Health Sciences

Study Protocol

Exploring the Multifaceted Relationship Between Walking and Chronic Low Back Pain in Adults: Perceptions, Experiences, Barriers, Facilitators, Behaviors, and Motivations – A Systematic Review and Meta-aggregation Protocol

Valentin Dones III[1,2], Donald Manlapaz[1,2], Hans Paolo Alarde[2], Moira Aleah Francess Dulnuan[2], Rudolph Kyle Elefante[2], Janna Crystal Koa[2], Viktoria Nicole Mendoza[2], Adriel Quinones[2]

[1]Center for Health Research and Movement Science, College of Rehabilitation Sciences, University of Santo Tomas, Manila; [2]Department of Physical Therapy, College of Rehabilitation Sciences, University of Santo Tomas, Manila, NCR, Philippines

Correspondence should be addressed to: Janna Crystal Koa[2]; jannacrystal.koa.crs@ust.edu.ph

Article Received: December 23, 2024

Article Accepted: June 5, 2025

Article Published: August 15, 2025

Abstract

Background: Walking is widely recognized for its benefits in pain management, disability reduction, and psychological well-being, primarily due to its cost-effectiveness and accessibility. However, comprehensive qualitative insights into the full extent of its benefits remain insufficient. Chronic low back pain (CLBP) significantly impairs daily activities, requiring a multifaceted intervention approach, as advocated by the Biopsychosocial (BPS) model and the International Classification of Functioning, Disability, and Health (ICF) framework. **Objectives**: This systematic review aims to evaluate the perceptions and experiences related to walking among adults suffering from CLBP, understand the barriers and facilitators influencing walking behaviors, analyze behavioral patterns, and examine internal motivators for walking. **Methods:** This systematic review will include both published and unpublished qualitative studies with participants aged ≥18 with CLBP persisting ≥ 3 months, where walking is utilized as the primary or secondary intervention. Databases, including PubMed, EBSCO Host, Science Direct, ProQuest, MEDLINE, Epistemonikos, Cochrane Database, and Web of Science, will be searched without language or year restrictions. The screening will involve an independent dual review of the title/abstract and full texts, followed by a critical appraisal. Data extraction and synthesis will employ a meta-aggregation approach, with findings assessed via the ConQual approach. **Expected Results:** Synthesized findings will guide evidence-based practice. Recommendations will provide actionable insights to address gaps in qualitative research on walking, promoting a holistic, patient-centered approach to treatment. **PROSPERO registration number:** CRD42024509069.

Key Words: *chronic low back pain; pain management; adult; walking; social factors*

INTRODUCTION

Chronic low back pain (CLBP) is defined as persistent pain in the lower back lasting for at least 3 months.[1] Approximately 75% of individuals with chronic severe back pain reported experiencing disability, impacting their mobility, ability to work, social engagement, and self-care activities.[2] Unlike acute low back pain, CLBP is multifactorial, influenced by an interplay of physical, psychological, and social factors.[3-4] Physically, CLBP may stem from musculoskeletal imbalances, spinal degeneration, and poor posture. Psychologically, maladaptive beliefs such as fear-avoidance, along with factors such as stress, depression, and anxiety, may contribute to the persistence and severity of pain.[3] Social and lifestyle factors, including reduced physical activity, occupational demands, inadequate social support, and high levels of work-related stress, further aggravate the condition.[4] These factors emphasize the need to consider a multidimensional approach in assessment and management.

The Biopsychosocial (BPS) model and the International Classification of Functioning, Disability and Health (ICF) framework provide comprehensive paradigms for understanding CLBP, beyond the biomedical model.[5-6] The BPS model explains CLBP as a result of dynamic interactions of biological, psychological, and social factors, such as physical impairments, emotional distress, and contextual influences like work or family environment. The ICF framework complements this by classifying domains–linking biological impairments to body structure/function, psychological aspects to personal factors, and activity limitations, and social aspects to participation restrictions and environmental barriers. These models support the use of a holistic, individualized, and interdisciplinary approach. Integrating these models into clinical practice may address the multifaceted needs of CLBP, improving patient outcomes and reducing disability.[7] Despite this, clinical practice remains predominantly focused on the biomedical aspects of CLBP, often neglecting the critical psychological and social dimensions.[5] This gap reveals the importance of accessible, low-cost, patient-centered care that addresses the multifaceted needs of CLBP. Walking, as a form of physical activity and moderate-intensity aerobic exercise, offers a promising solution.

Walking effectively improves the pain and disability of patients with CLBP.[8-9] It is widely accepted by individuals with CLBP due to its accessibility, affordability, and adaptability, allowing individuals to easily integrate it into daily life and addressing common barriers to exercise.[9-10] As a physical activity and moderate-intensity aerobic exercise, walking improves cardiovascular fitness, reduces pain, and provides psychological and social benefits.[11-12] Biologically, walking enhances trunk coordination and postural control, reducing physical dysfunction associated with CLBP.[8] Psychologically, it reduces fear-avoidant beliefs and promotes self-efficacy, encouraging movement in a low-threat manner and reducing pain-related anxiety.[3] Socially, walking can be done in groups or community settings, improving adherence and enhancing social interaction, which contributes to overall well-being.[11-12] This aligns with the ICF domains by improving body function, daily activity, and participation by enhancing mobility, reducing pain, and enabling engagement in social and occupational roles.[9-10] Several studies[8-9] also indicate that walking is as effective as other pharmacological treatments in relieving pain and disability among patients with CLBP. Therefore, it can be considered a valuable alternative to other physical activities.[8]

While most existing reviews concentrate on quantitative outcomes (e.g., pain intensity) and the efficacy of interventions, they often overlook nuanced, subjective experiences, beliefs, motivations, and barriers encountered by individuals with CLBP. In contrast, qualitative synthesis methods, such as meta-aggregation and thematic analysis, explore these dimensions, create themes, and offer valuable insights through the synthesis of narrative data across multiple studies.[13] Moreover, unlike scoping or mixed-method reviews, qualitative synthesis offers a focused, in-depth understanding of the lived experiences of individuals, making it more suitable for informing patient-centered care.

An initial search through various databases, including PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis, revealed no ongoing systematic reviews. A systematic review by Slade et al.[14] explored the beliefs and perceptions of exercise among patients with nonspecific CLBP (NSCLBP), including an analysis of 15 papers through data extraction, methodological quality assessment, and thematic analysis. This review described NSCLBP as continuous or episodic back pain without specifying a duration for chronicity, thereby underscoring its persistent or intermittent nature. Although some participants had a positive perception towards walking, nuanced experiences and walking's potential within the BPS model were not examined in-depth.

Objective. With the growing recognition of walking as a multifaceted intervention and the lack of qualitative synthesis on patient perception and experience, the study aims to (1) evaluate published and unpublished qualitative evidence on the perceptions and experiences of patients with CLBP aged $\geq$18 with walking, (2) understand the barriers and facilitators of

patients with CLBP, and (3a) analyze the behavioral patterns and (3b) examine the internal motivators influencing walking among patients with CLBP.

Methodology

This systematic review will follow JBI's methodology for systematic reviews of qualitative evidence.[15] The protocol of the review was submitted for PROSPERO registration: CRD42024509069.

The review team is comprised of 8 researchers (5 male, 3 female) in the field of physical therapy. Two authors (VD, DM) are research supervisors holding doctoral degrees (PhD) with prior experience in conducting systematic reviews & are actively involved with research publications related to physiotherapy. Author VD is also an information specialist who is a JBI Trainer for the Comprehensive Systematic Review Training Program, thereby offering expertise in JBI meta-aggregation. Moreover, author DM had previous experience in publishing a qualitative systematic review using framework synthesis. Other authors (JK, VN, MD, HA, KE, AQ) received personal training and guidance from VD and DM throughout the duration of the systematic review. The existing knowledge from authors VD & DM helps with meaningful data interpretation, but may also present different perspectives based on their focused discipline. Additionally, the beliefs and personal experiences of the reviewers may impact the understanding of the participants' own perceptions and experiences, affecting data extraction & synthesis.

To mitigate biases, each member of the review team shall independently assess & extract data from included studies. In the cases of conflicts, there will be a third reviewer (VD or DM) available for discussion. Moreover, team meetings will be scheduled to resolve conflicts or inconsistencies, establish transparency, and reflect on how personal beliefs or experiences may affect the data interpretation. Lastly, to ensure the reliability of the synthesis, the final decisions made by the team due to conflicts shall be documented.

Eligibility Criteria. The characteristics of the studies included in this systematic review are detailed in the following paragraphs (see Table 1).

Participants. The systematic review will focus on studies involving individuals aged 18 or above with CLBP for $\geq$ 3 months.

Table 1. Eligibility Criteria

Inclusion	Exclusion
Participant Individuals aged $\geq$ 18 with CLBP for $\geq$ 3 months	Participants with pregnancy-related back pain or severe underlying health conditions (e.g., fractures, tumors, or spinal cord injuries)
Phenomena of Interest Barriers, facilitators, and influences on walking behavior. Psychological motivations, perceptions, and qualitative experiences related to walking.	Quantitative studies (e.g. RCTs, cross-sectional surveys, cohort studies). Commentaries, editorials, reviews, and conference proceedings with inaccessible data.
Context Studies exploring walking as a treatment for CLBP.	
Types of Studies Published and unpublished qualitative studies using focus groups, interviews, or ethnographic observations	

Studies that include participants with pregnancy-related back pain or severe underlying health conditions, such as fractures, tumors, or spinal cord injuries, will be excluded.

Phenomena of Interest. The study will investigate the experiences of adults with CLBP who engage in walking as a physical activity for pain management. Through a synthesis of qualitative data, this systematic review will examine the multifaceted relationship between walking and CLBP, specifically focusing on participants' perceptions, experiences, barriers, facilitators, behaviors, and internal motivations.

First, the participants' perceptions of walking as a management strategy for CLBP will be synthesized. This includes beliefs about the benefits, risks, and effectiveness of walking for CLBP management. Detailed qualitative accounts of feelings, thoughts, and sensations associated with walking will be analyzed, highlighting both positive and negative experiences.

Second, it will investigate the barriers and facilitators influencing individuals' ability and willingness to walk. This may involve external factors such as environmental constraints and social support systems, as well as internal factors like personal beliefs regarding the effectiveness of walking for managing CLBP.

Third, specific walking behaviors, including frequency, duration, intensity, and style, will be examined to elucidate typical physical activity patterns among adults with CLBP.

Finally, the study will explore internal motivations that drive walking, such as the desire to improve overall well-being, alleviate pain, or enhance physical function. This involves exploring the internal factors and aspirations that influence the decision to engage in walking.

Context. This systematic review will analyze studies exploring walking as a treatment for CLBP. The review will create a detailed and distinct understanding of the experiences of adults with CLBP who engage in walking as a form of physical activity.

Types of Studies. The review will incorporate published and unpublished qualitative studies. Eligible studies must utilize methods with a qualitative approach, including focus groups, interviews, or ethnographic observations, to investigate the perceptions and experiences of individuals with CLBP regarding walking. Mixed methods studies will be included only if they contain clearly extractable qualitative data that aligns with the review objective. Quantitative studies, which include randomized controlled trials, cross-sectional surveys, and cohort studies, will not be included to focus on qualitative data that provide in-depth insights. Additionally, commentaries, editorials, reviews, and conference proceedings where the data is inaccessible to the authors will not be included.

Search Strategy. A three-step search strategy will be employed to locate published and unpublished studies. First, an initial search in PubMed and ScienceDirect will be conducted. This is followed by an analysis of the terms used in the titles, abstracts, and index terms of retrieved articles (see Supplementary Material A). Secondly, a second search will be performed using a search adapted to the features and search capabilities of each database. An information specialist who received training in the JBI Comprehensive Systematic Review Training Program will be involved in refining the search strategy. This process will continue, undergoing thorough documentation and refinement, until the search strategy is able to identify at least five relevant studies to ensure the search is thorough and effective. Thirdly, additional studies will be screened by reviewing the reference lists of included studies.

The databases searched will include PubMed, EBSCOhost, Science Direct, MEDLINE, Epistemonikos, Cochrane Database, Web of Science, ProQuest, and Google Scholar. To identify unpublished studies and grey literature, ProQuest and Google Scholar will be searched using adapted search terms. Additionally, relevant clinical trial registries such as ClinicalTrials.gov and the Australian and New Zealand Clinical Trials Registry (ANZCTR) will be examined. Published studies from the beginning will be covered with no language or publication year restrictions.

Study Selection. Once the search is complete, the reviewers will gather and transfer the citations to Zotero. Any duplicate records found during the electronic search will be removed before the screening. Pilot testing will then be administered to enhance the reliability of the screening process, ensuring the eligibility criteria are clearly understood and consistently applied across reviewers. Two independent

reviewers will assess citations' titles and abstracts, referring to the eligibility criteria defined for the review. Studies not meeting the eligibility criteria will be excluded from further consideration.

After the initial screening, two independent reviewers will evaluate the included full-text studies to thoroughly assess eligibility. Potentially relevant studies will be retrieved in full, and their citation details will be compiled in MS Excel (see Supplementary Material B). If full-text studies are inaccessible, attempts will be made to obtain them by contacting the authors via email or accessing the Library. Studies for which full-text copies are unavailable will be excluded from the review. The same independent reviewers will then carefully evaluate the full-text studies based on the eligibility criteria. Any reasons for excluding the studies will be documented and detailed in this study. The two reviewers may discuss or consult with a third reviewer when disagreements arise.

The process and results of the search and study selection will be documented using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) flow diagram (See Supplementary File E). This thorough and transparent method ensures the identification, assessment, and synthesis of evidence from the relevant literature.

Assessment of Methodological Quality. All included studies, both published and unpublished, will undergo appraisal. Two independent reviewers will critically assess the quality of the methodologies used in relevant studies using the standard JBI critical appraisal checklist for qualitative research.[15] Reviewers must be familiar with the tool and receive prior training before conducting the appraisal. If necessary, the reviewers may also contact the authors to request or clarify any missing or additional data. The two reviewers may discuss or consult with a third reviewer when disagreements arise.

This tool examines the alignment between philosophical perspectives and research methodology, the consistency between methodology and research objectives, the accuracy of collecting and analyzing data, the influence of researcher bias, the clarity and credibility of the results, and the study's contribution to the field. Criteria are rated as "Yes," "No," "Unclear," or "Not applicable." Using the JBI critical appraisal checklist, researchers can determine the trustworthiness and relevance of study results, identify biases or limitations, and make informed decisions about study inclusion or exclusion. Analysis of JBI critical appraisal checklist results will highlight methodological strengths and weaknesses across studies, help guide the synthesis and interpretation of qualitative data, and ultimately improve qualitative research synthesis's transparency, validity, and reliability.[15]

Data extraction. Two reviewers will utilize the standardized JBI data extraction tool to collect information from the included studies (see Supplementary Material C).[13] Before beginning the study, the tool will be tested and revised to address any potential difficulties with research processes and protocols. The tool will be piloted by two independent reviewers on five selected studies. Once the correctness and completeness of the initial data extraction have been confirmed, the reviewers will proceed with extracting data from other studies. Data collection will contain thorough details regarding the study's methodology, method, phenomena of interest related to the review objectives, setting, geographical location, culture, participants, data analysis, and the author's findings.[13] Results and supporting illustrations will be collected and given a credibility level to help aid in synthesis and conclusions.[13] The levels of credibility–unequivocal, credible, and not supported–dictate the reliability of the findings in relation to their illustrations. Unequivocal findings are supported by indisputable illustrations. Credible findings are supported by illustrations that lack association with the finding, making it arguable. Findings are considered not supported when the illustration does not clearly define the finding. The two reviewers may discuss or consult with a third reviewer when differences arise. In some cases, the study's authors may be contacted up to twice, with a two-week gap between emails, to

ask for missing or additional data, allowing enough time for a response.

Data Synthesis. Findings from the qualitative studies will be synthesized using the JBI SUMARI and the meta-aggregation approach as the framework for qualitative synthesis.[16] The meta-aggregation approach supports evidence-based practice by generating lines of action, derived from the synthesized findings, that inform recommendations for policy and clinical practice.[13] This process begins by organizing the extracted data (also known as findings) into categories based on their similarity in meaning. This is followed by combining categories to create synthesized findings, which are statements that represent the combined data from primary investigations. To facilitate this process, the JBI SUMARI Qualitative Synthesis tool will be used for efficient classification of findings into categories and subsequently into synthesized findings. As an end product, a meta-aggregative flowchart will be developed to visually display the process of data synthesis. Only findings assessed as unequivocal and credible will be included in the synthesis, separating the unsupported findings to maintain methodological rigor. Moreover, the results will be presented narratively if textual pooling is not possible or feasible.

Assessing confidence in the findings. The synthesized results will be assessed using the ConQual approach to determine confidence in the results of the study's synthesis. Confidence ranking (high, moderate, low, very low) is assigned based on the dependability (appropriateness of methodology) and credibility (unequivocal, credible, or not supported findings) of the studies under each synthesized finding. For dependability, the methodological congruity with the research objectives, data collection, and data analysis, as well as reflexivity & transparency of each study, must be considered. This is answered by the decisions made under Q2, Q3, Q4, Q6, and Q7 of the JBI Critical Appraisal Checklist. The number of the unequivocal findings and "yes" responses to the questions will dictate the confidence ranking for both credibility & dependability. Hence, all findings will start as high but may downgrade based on the criteria for dependability & credibility.

These confidence rankings will later be presented in a Summary of Findings (SoF).[17] The SoF will include the review's important components and explain the calculations behind the ConQual score. The table will include each review's title, participants, phenomena of interest, and context. Each synthesis finding will be presented with the study informing it, scores determining dependability and trustworthiness, and an overall ConQual score.

EXPECTED RESULTS

The study will provide an in-depth examination of the existing evidence on people's perceptions and experiences when walking with CLBP. It will identify barriers and facilitators that influence walking engagement, including psychological, social, and environmental factors, while analyzing behavioral patterns such as frequency, intensity, and walking duration. Internal motivators, including pain reduction, improved physical function, and enhanced well-being, will also be explored.

Through qualitative data aggregation, the review will develop synthesized findings to guide evidence-based practice, providing insights into how walking impacts the management of CLBP. The findings are expected to support the integration of walking as a low-cost, accessible, and effective strategy within the BPS framework. The recommendations will provide actionable insights to address gaps in qualitative research on walking, fostering a holistic, patient-centered approach to treatment.

Individual Author's Contributions

All authors contributed equally to this study protocol.

Disclosure Statement

The authors will self-fund this review.

Conflicts of Interest

Authors CD and DM are part of the PJAHS Editorial Board.

Supplementary Materials

Supplementary Material A. Sample Search Strategy from PubMed and ScienceDirect

Supplementary Material B. Full-text Screening

Supplementary Material C. JBI Data Extraction Table

Supplementary Material D. PRISMA-P 2015 Checklist

Supplementary Material E. PRISMA Flow Diagram

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